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AN APPARATUS FOR APPLYING DUSTS AND SPRAYS
TO SMALL PLANTS IN THE LABORATORY

By Walter E. Peay and William N. Oliver
Entomology Research Division



An apparatus is described for applying dusts and sprays to small plants in laboratory tests. It was designed to give a uniform cover of insecticide to all parts of individual plants. It is a modification and refinement of various devices used by different workers at the Twin Falls, Idaho, field station.



Equipment

A small electric fan, with the blades removed, is mounted at the left edge of a 12 x 17 inch baseboard with a single bolt to permit swiveling the motor to tighten or loosen the drive belt. A piece of 1-inch strap iron 36 inches long, made into an incomplete rectangle by bending at right angles 2 and 9 inches from each end, is bolted to the baseboard for supporting the reduction pulleys and turntable. A 7-inch pulley (A) mounted on a 3/8-inch bolt 7 inches long, threaded for 3 inches, is attached to the motor. A nut and washer at the end of the threads prevent this pulley from dropping. A 1-inch pulley attached to A is connected to a 5-inch pulley (B), which drives a turntable 6 inches in diameter. This gives the turntable a speed of 12 revolutions per minute. Pulley B and the turntable are fastened to a 3/8-inch headless bolt 7 inches long, placed in a 3/8-inch pipe cap, and sunk in the baseboard so that the table turns with the pulley. A box 2 feet long, 14 inches wide, and 14 inches deep, made of 1/2-inch plywood, is used to house the drive gear and support a bell jar. A hole 4 inches in diameter is cut in the box so that a No. 2 can or a 4-inch flower pot can be inserted and rest on the turntable. Two 1/4-inch holes are drilled at 45° angles so that they emerge just inside the bell jar on opposite sides. Two pieces of 1/4-inch glass tubing constricted to 1 mm. at the outlet ends are bent to fit the box when inserted in the holes. They are connected with a T-tube by rubber hose. A second T-tube connects the first to the air line.

Operation

Quantities of dust placed in small test tubes fitted with holed rubber stoppers can be gradually propelled into the bell jar through the second T-tube by inverting the test tubes while the plant is turning. The quantity of dust applied is calculated by weighing the amount falling on cubic centimeter paper placed in the bell jar, and the apparatus calibrated accordingly. Half a gram of dust released in the bell jar shown is equivalent to 30 pounds per acre. The constricted glass tubing gives a better separation of dust particles than nonconstricted tubing, resulting in a better distribution. With the dust released at 45° angles from two sides of the revolving plant, all parts of the plant are completely and evenly covered.

The apparatus with the bell jar removed is very well adapted for spraying individual plants. A DeVilbiss spray gun (Type CV) attached to an air hose at 10 pounds' pressure and held 2 feet from the revolving plant gives complete coverage of small plants with 5 cc. of spray material.